



Sensor nodes to improve quality and yield of your crop

Key Benefits

- No risk of **growing toxic products** due to damaged batteries
- **Reduced maintenance cost** – no battery changes will EVER be needed
- **Lower cost** than standard wireless sensors
- Can be applied to both greenhouses and **open areas**

The Challenge

All farmers and growers recognize that **water** use and supply is an essential factor in crop production. Plants suffer stress when they cannot get enough water. Drought stress causes the closure of the leaf stomata, which restricts photosynthesis and thereby reduces growth.

New technology is transforming the agriculture business, putting real-time information and analysis of every step from planning and planting to harvesting right at the fingertips. However, sensor and communication solutions require some sort of power supply. Even though energy harvesting devices can be used to increase the expected battery-life – especially solar panels in open areas – these **systems require batteries** to run.

On the one hand, batteries will have to be replaced sooner or later, which implies heavy maintenance costs. On the other hand, they can cause soil and water pollution and endanger wildlife. The chemicals can also bio-accumulate in food, which makes this food unfit for human consumption.

The Farsens Solution

Farsens's proposal is a system that works with **battery-free soil moisture sensor tags**.

RFID sensor tags are placed in key representative locations and users can monitor soil moisture at any time. This can of course be extended to other types of sensors such as ambient humidity, temperature or even pressure.

Accurate temperature information helps engineers design motors without having to oversize the magnets. The **real-time temperature monitoring** solution will alert about critical temperatures so the rotor can be slowed down or even stopped to prevent damages.

Allows for irrigation automation based on objective data

Sensor data can be collected and acted upon. Once the RFID reader gets the sensor data, it can be processed and the information can be used as a basis for different activities – such as the decision to start irrigation.

Specifically, in greenhouses RFID sensor tags can automate staff reporting activity by automatically filling in plant status information using unique ID and time stamp features of the RFID system.

Lower cost and non-toxic

The fact that RFID passive sensors do not use batteries at all guarantees that soil will not be damaged due to battery related chemicals.

Moreover, for applications where hundreds of sensors are scattered around, not using batteries results in very meaningful savings in maintenance costs.

Apply them to greenhouses and open areas

Greenhouses typically require a closer look at each plant one by one, especially in those greenhouses being a testing lab for a future larger crop. This application generally requires using a sensor per plant, allowing personnel to move around with handheld readers gather all data hassle free. Reports are automated and human error free.

In open areas it makes more sense to control specific land areas with a set of sensors. With correct assumptions of how that data varies across the specific area, farmers can define and automate actions based on these data. Data can be collected via mobile devices such as UGVs (Unmanned Ground Vehicles) or UAVs (Unmanned Air Vehicles).



Plant growth monitoring in controlled area
Battery-free soil moisture sensor tag

For more information check the White Paper at www.farsens.com/landingpage/agriculture-irrigation/white-paper.html

Farsens S.L.

Paseo Mikeletegi 54, Planta 0
20009 San Sebastian - Spain
Phone/fax: **+34 943 308013**



www.farsens.com
info@farsens.com
<http://blog.farsens.com>